annual temperature of 61° F. Frost never occurs, though it is frequent at slightly higher elevations, such as Nuwara Eliya (6200 feet). There is, unfortunately, no accommodation for visitors at present nearer than Nuwara Eliya, six miles away; but it is hoped to erect a small laboratory in the garden, with a small living room attached, where workers may live and sleep.

A fourth garden is kept up at Badulla, the capital of the Uva province, at an elevation of 2200 feet, on the eastern side of the mountains. The chief botanical interest of this district lies in its somewhat drier climate, so that it has much more pătănă land than the western side of the mountains, and in the fact that its dry season comes, not in the north-east but in the south-west monsoon, so that the periodicity of the vegetation is different. Fruit, which at Peradeniya ripens in March and April, ripens at Badulla in August, and so on.

Yet another garden is maintained at the ancient capital of the island, the famous "buried city" of Anuradhapura, the capital of the north-central province. This lies in the middle of the dry country, which makes up about three-fifths of the island, and has an Indian climate, with rain almost confined to the last three months of the year, and drought during the remainder, including the south-west monsoon. The flora of this district is therefore, as might be expected, very different from that of the rainy south-western and central provinces.

The island can show, within an area of rather less than that of Ireland, a most remarkable range of climate and flora, rendering it very interesting to the traveller and naturalist; in this respect it is unrivalled in the tropics. The working botanist or student has, further, the great advantage of having at his hand the excellent flora prepared by Dr. Trimen, and finished after his death by Sir Joseph Hooker. There are doubtless many new species still to be found in the eastern and south-western districts, as well as many unrecorded species; but the student who does not desire to specialise in this department of botany will be grateful for the useful flora, which renders the identification of his collections, or of the plants he may be experimenting with, a matter of comparative ease. The vascular cryptogams and many of the mosses have been identified, but there is much to be done at the lower forms of vegetation.

Peradeniya is easily reached from any part of the world, Colombo being one of the greatest ports of call. Direct lines of steamers run to Europe, China, Japan, Java, Queensland, Adelaide, Melbourne and Sydney, Mauritius, South Africa, and all Indian ports. Madras may be reached in thirty-eight hours by boat and rail. To England there is a very large choice of steamers. The favourite lines with Ceylon people are perhaps the Bibby and the Norddeutscher Lloyd, but the P. and O., the Orient, Messageries Maritimes, British India, and many others, are much used. The first-named is the cheapest of the large English lines, but is first-class only. First-class returns to Colombo, available for six months, are from 70*l.* to 90*l.* Second-class, which is very comfortable on the largest lines, is from 50*l.* to 60*l.* A few pounds are necessary on the voyage for tips, sports, trips on shore, &c. Banking accounts may be opened in Kandy, and money easily remitted to and from Europe. The value of the rupee is now 1*s.* 4*d.*, and seems likely to remain at that figure.

Very little is necessary in the way of outfit. Drill and khaki clothes can be bought here for less than half their price in England; also topees (sun-hats). At Kandy the usual dress is similar to that worn in England in summer; at Nuwara Eliya it is colder, and tweed suits are often worn. All articles of clothing can be bought here, and usually as cheaply as, or more so than, in Europe.

The usual division of the day is as follows: Rising at daylight, a light early tea of eggs and toast is taken about 6.15, after which a walk in the garden is pleasant, commencing laboratory work at 7.30, and continuing till 11, which is the breakfast hour. After breakfast follows a rest indoors, but not sleep, and work may be resumed at about 1.30 for a couple of hours or so. After tea the remaining two hours of light are given to tennis, cycling, and other forms of exercise, followed by a bath, and dinner at 7 or 7.30. The evening is devoted to amusement.

Travelling in Ceylon is easy in all but the most out-of-the way or sparsely populated parts. Railways and good roads intersect the greater part of the island, and there are coach services to a great number of places not served by the railways. Rest-houses or Government inns are found in all towns that have no hotels, and at intervals of 14 miles along all main roads. The average cost of living while on tour may be put down as about Rs. 7 or 8 per diem exclusive of fares by rail or coach. Steamers run round the island, calling at all the chief ports.

There is at present no rest-house or hotel at Peradeniya itself, and visitors must live in Kandy, where arrangements have been made with some of the hotels to board persons working in the laboratory at from Rs. 5 to Rs. 7 per day. There is a convenient service of trains, but the most satisfactory way is to cycle in and out. The road is in excellent order, and the distance from the furthest hotel under five miles. It is hoped that accommodation may be provided at Peradeniya itself before long.

Assuming that six months are spent from starting to date of arrival back in Europe, the cost of the trip should not much exceed 185*l.*, made up thus:

Fare (first return)	£85
Twenty weeks' board	66
Travelling	20
Sundry	12 to 20
	£191

This might be much reduced by economy, and by travelling second-class from Europe, and the proportionate cost would of course be less if the visit were of longer duration. If much travelling is to be done in the island the amount shown above will have to be increased, the 20*l.* being allowed for four weeks only. By very close economy and reduction of travelling, and by travelling second-class, the total might be reduced to perhaps 140*l.*

Trustworthy information about Ceylon may be obtained in various books. The most interesting are Sir E. Tennent's "Ceylon," which is now out of print; and to a botanist, Trimen's paper "On the Flora of Ceylon as affected by Climate," in the *Journal of Botany* for 1886. Ferguson's Handbook and Directory contains a vast mass of information and statistics, and his "Ceylon in 1893" is also of interest.

Intending visitors should communicate some time in advance with the director, mentioning what line of work they propose to take up, and any special facilities they may require.

JOHN C. WILLIS.

THE STOCKHOLM INTERNATIONAL FISHERIES CONFERENCE.

THE International Conference, which met in Stockholm from June 15 to June 23 last, and had for its object the arrangement of a scheme for the exploration of the northern seas in the interests of fisheries, has now issued its report. The Conference assembled at the invitation of the Government of Sweden, and official representatives attended on behalf of the Governments of Germany, Denmark, Great Britain, Norway, Holland, Russia and Sweden.

The formal resolutions unanimously passed by the delegates—Messrs. Archer, Cleve, Drechsel, Ekman, von Grimm, Heincke, Hensen, Herwig, Hjort, Hoek, Knudsen, Krümmel, Lehmkuhl, Lundberg, Murray, Nansen, Petersen, Pettersson, D'Arcy Thompson, Trybom, Åkerman—were as follows:—

Considering that a rational exploitation of the sea should rest as far as possible on scientific inquiry, and considering that international co-operation is the best way of arriving at satisfactory results in this direction, especially if in the execution of the investigations it be kept constantly in view that their primary object is to promote and improve the fisheries through international agreements, this International Conference resolves to recommend to the States concerned the following scheme of investigations, which should be carried out for a period of at least five years.

Programme for the hydrographical and biological work in the Northern parts of the Atlantic Ocean, the North Sea, the Baltic and adjoining Seas.

A.—THE HYDROGRAPHICAL WORK.

I. The hydrographical researches shall have for their object: the distinction of the different water-strata, according to their geographical distribution, their depths, their temperature, salinity, gas-contents, plankton and currents, in order to find the fundamental principles, not only for the determination of the external conditions of the useful marine animals, but also for weather-forecasts for extended periods in the interests of agriculture.

II. As the hydrographical conditions are subject to seasonal changes, and as these strongly influence the distribution and life-conditions of useful marine animals and the state of the weather and other general meteorological conditions, it is desirable that the observations should be made so far as possible simultaneously in the four typical months, February, May, August and November, at definite points along the same determined lines.

III. The observations referred to in II. would consist of:—

(*a*) Observations of temperature, humidity and pressure of the air every two hours; self-registering instruments for interpolation, and Assmann's aspirator should be used.

Opportunities should be afforded to the meteorological offices to make on board the ships physical observations on the higher levels of the atmosphere by means of kites.

The other meteorological observations are to be carried out according to the methods adopted by the meteorological offices of the nations represented.

The observations, meteorological as well as hydrographical, made on board the special steamers at the time of the survey in the typical months, are to be immediately worked out under the supervision of the central bureau (see C) for publication in a bulletin, wherein the conditions of the sea and the atmosphere are to be represented by tables and synoptical charts in cooperation with the meteorological institutes of the nations represented.

(*b*) The temperature of the surface water shall be taken every two hours, or, when necessary, more frequently. It is desirable that self-registering apparatus should be used for interpolation.

Observations on the vertical distribution of the temperature are to be taken at the points mentioned in II., and should be taken regularly at intervals of 0, 5, 10, 15, 20, 30, 40, 50, 75, 100, 150, 200, 250, 300, 400 metres, and so on; but all *critical* parts of the curve must be determined by extra-readings.

The bottom-temperature is to be investigated with all possible care.

(*c*) At every point and from every depth where the temperature is observed, a sample of water shall be collected for the determination of its salinity and density.

By *salinity* is to be understood the total weight in grammes of the solid matter dissolved in 1000 grammes of water.

By *density* is to be understood the weight in grammes[1] of one cubic centimetre of water of the temperature *in situ* $t°$, *i.e.* the specific gravity *in situ* referred to pure water of $+4°$C. $\left(= S\frac{t°}{4°}\right)$.

For orientation, preliminary determination of the salinity should be made on board ship with expedient instruments, but the exact determination of the salinity and density of all samples shall take place in a laboratory for scientific work.

(*d*) At certain depths of the points mentioned in II., and elsewhere on the surface, water samples should be collected for analysis of the gas-constituents (oxygen, nitrogen and carbonic acid).

IV. For measurement of depth the *unit* to be adopted is the metre, together with which the depth may be also recorded in English fathoms.

Geographical points are to be referred to the longitude of Greenwich, and horizontal distances are to be expressed in sea-miles (= 1852 metres).

Thermometers to be used for the determination of the surface-temperature may be either centigrade or Fahrenheit, but for publication all numbers are to be reduced to centigrade.

In the centigrade thermometers the distance between two degree-marks should be at least 5 mm. and the degree divided at least in two parts; the Fahrenheit thermometer to be divided in a corresponding manner.

The use of Pettersson's insulated water-bottle is recommended for moderate depths, and the thermometers used for this apparatus should have a space at least 10 mm. between the marks of one degree, and the degree should be divided in ten parts.

For greater depths of the ocean Negretti-Zambra's or other thermometers of a similar type should be used.

The glass to be used for the thermometers as well as the thermometers should be tested and approved by the central bureau (see C, *a*).

For the determination of salinity and density either chemical or physical methods may be adopted, provided that the salinity can be determined with an accuracy of $0{,}_{05}$ in a thousand parts (and the density up to $0{,}_{00004}$).

The determination of these constants can be founded either upon chemical analysis of the halogen by weighing or titration, or upon physical determination of the specific gravity by means of hydrostatical balance pycnometers and hydrometers, provided that measures be taken to exclude disturbances arising from thermal effects, capillarity, viscosity, &c.

The chemical analysis shall be controlled by physical methods, and the physical determinations by chemical analysis in the following manner:—

From every collection of samples examined at least three shall be selected and sent to the central bureau. *Standard samples* shall be sent in return.[1]

The *specific gravity* is to be represented in the tables by the formula $S\left(\frac{0°}{4°}\right)$.

V. Samples for gas analysis are to be collected each time in a pair of sterilised vacuum tubes.

It is desirable that the existing tables of absorption of nitrogen and oxygen should be revised.

VI. Qualitative plankton-observations should be made every six hours by pumping through a silk net (N : r 18) for the space of fifteen minutes, and at the same time a sample of water (III. *c*) should be taken.

At the points mentioned in II. samples for quantitative analysis are to be collected according to the method of Prof. Hensen at different depths depending on the hydrographical circumstances.

Petersen's modification of Hensen's net is recommended.

Observations on transparency and colour of the water should be made at the points mentioned in II.

Opportunities should be afforded to bacteriological institutions to carry out investigations in the ocean.

VII. Observations on currents and tides should be carried out as frequently as the circumstances allow.

The currents should be examined, when possible, by direct current-meters and by surface and intermediate floats and by bottom-rollers.

The ship should be anchored occasionally in order to make frequent observations during a complete period of tide.

VIII. It is desirable that a chart should be prepared of the bottom of the seas examined, showing the nature of the sea-bottom.

The description of the deposits is to be carried out on a definite plan, to be afterwards settled (see Appendix III.).

IX. The normal observations are to be carried out along the lines provisionally drawn on the annexed chart, where *R* denotes the Russian, *F* the Finnish, *S* the Swedish, *G* the German, *Da* the Danish, *Du* the Dutch, *N* the Norwegian, and *B* the British lines.

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[1] Units of weight are here used instead of mass-units.

[1] By *standard* water shall be understood samples of filtered sea-water, the physical and chemical properties of which are known with all possible accuracy by analysis, and statements of which are sent to the different laboratories, together with samples.

In respect to halogen the ordinary water-samples have to be compared with the standard water by analytical methods.

The special points are to be decided by the respective nations, and when once chosen the subsequent observations are to be repeated at the same points.

The particular instructions for the stations will be given by the respective nations, and the communications as to the extent and the nature of the observations shall take place through the central bureau (see C, *a* and *e*).

X. It is desirable, in carrying out these investigations, to make use of regular liners, light-ships, &c., and coast stations for the purpose of taking temperature-observations and collecting samples of sea-water and plankton.

These observations are to be taken not only in the typical months, but also during the intervening periods.

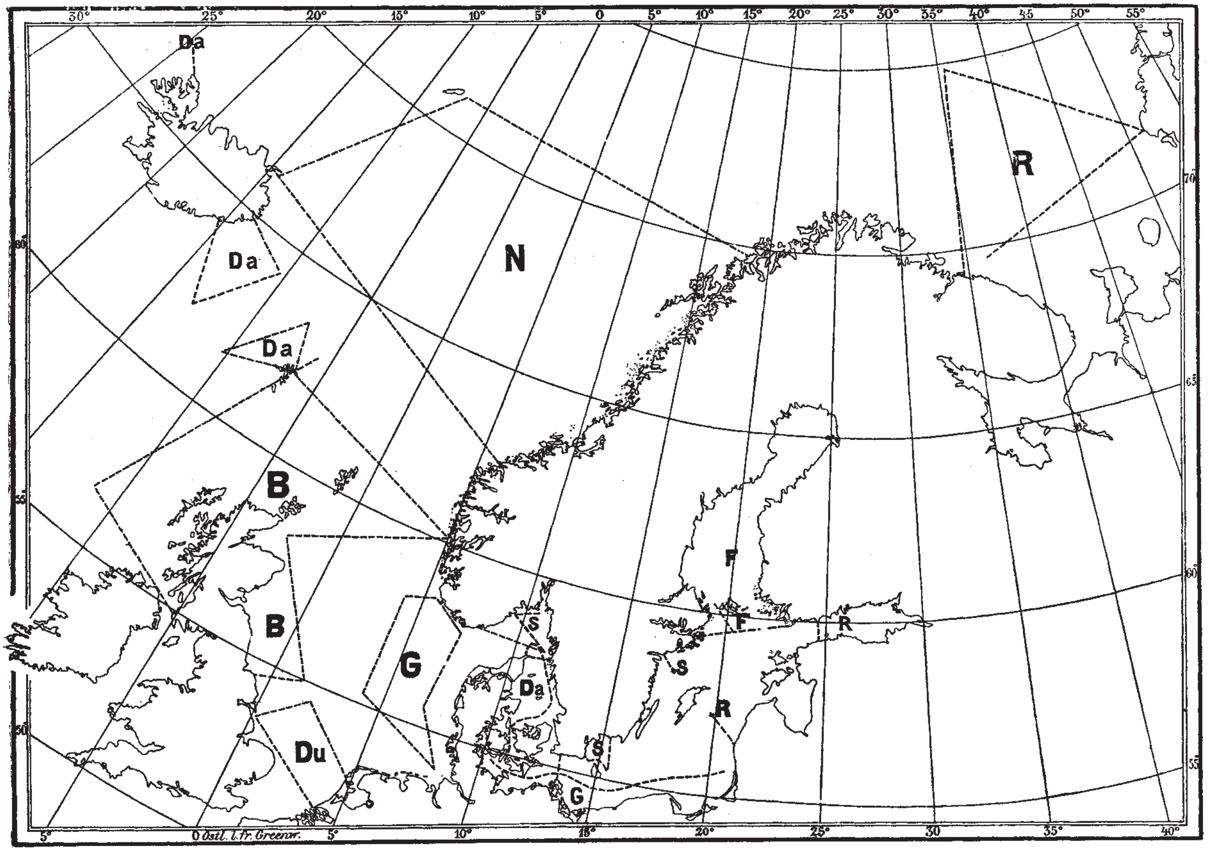
abundance, and average size of economic fishes, and the causes of the same.

II. (*a*) Experimental fishings *on* the known fishing grounds during the time of the fishery, as well as *outside* these areas and seasons.

(*b*) Preparation of uniform statistics of the experimental catches, with particulars of the number, species, size, weight and condition of the fish; for example, as done on board the *Garland* by the Scottish Fishery Board.

(*c*) The uniform use of appropriate apparatus for the experimental capture of the different species and sizes of fish.

(*d*) The experimental marking and liberation of fish, for instance, of plaice, on as large a scale as possible and over extensive areas; for example, as carried out by Dr. C. G. Joh. Petersen and Dr. T. W. Fulton (Reports of the Danish Biological Station and the Fishery Board for Scotland) and others (see Appendix IV.).



Division of Areas for Investigations in connection with Fisheries.

B.—THE BIOLOGICAL WORK.

I. (*a*) Determination of the topographical and bathymetrical distribution of eggs and larvæ of marine economic fishes; for example, by quantitative methods, such as those of Hensen, and with special reference to the most important species, such as plaice, cod and haddock, herring, &c. (see Appendix I.).

(*b*) Continued investigation of the life-history and conditions of life of young fishes of economic species in their post-larva stages and till they reach maturity, with special reference to their local distribution.

(*c*) Systematic observation of mature marketable fishes with reference to their local varieties and migrations, their conditions of life, nourishment (as, for instance, by investigation of the contents of the stomach), and natural enemies; also observations on the occurrence and nature of fish food at the bottom, the surface and intermediate waters down to depths of at least 600 metres (see Appendix I.).

(*d*) Determination of periodic variations in the occurrence,

III. (*a*) It is desirable to collect uniform statistics of the number, weight and value of the fish landed, of the means of capture, and of the persons engaged in the industry; for example, as in the General Reports of the Scottish Fishery Board.

(*b*) It is desirable to collect material for the preparation of maps, showing the fishing grounds and the kinds of fishing here practised (*cf.* A. VIII.).

C.—ORGANISATION OF A CENTRAL BUREAU.

I. The Conference recommends that there should be for the international hydrographical and biological researches of the seas an international Council with a central bureau, furnished with a laboratory (see Appendix II.). The central bureau will be:—

(*a*) To give uniform directions for the hydrographical and biological researches in accordance with the resolutions drawn up in the programme of the present Conference, or in accordance with such modifications as may be introduced later with the consent of the States represented.

(*b*) To control the apparatus and to insure uniformity of methods.

(*c*) To undertake such particular work as may be entrusted to it by the participating Governments.

(*d*) To publish periodical reports and papers which may prove useful in carrying out the co-operative work.

(*e*) To decide the graphic representations, scales, signs and colours to be used in the charts for the purpose of obtaining uniformity in the publications.

(*f*) To make, in connection with the investigations, application to the telegraph administrations for the purpose of obtaining determinations from time to time of the changes in the resistance of the cables which cross the areas in any direction.

II. (*a*) The permanent international Council should consist of commissioners elected by the Governments interested. Each Government may appoint two commissioners who may be represented at meetings by substitutes.

(*b*) The Council elects its president and vice-president, and appoints all officials connected with the central bureau. Should the general secretary represent hydrographical sciences, his principal assistant should represent the biological sciences, or *vice versâ*.

(*c*) The Council shall draw up its own order of proceedings.

(*d*) The expenses of the central office are approximately estimated at 4800*l.* (96,000 marks) yearly.

(*e*) The place of the central bureau, to be decided by the Governments concerned, shall at the same time be the residence of the general secretary, and should be conveniently situated for hydrographical and biological researches.

(*f*) It will be for the Governments concerned to decide among themselves the share to be borne by each.

Scheme for the Expenditure of the Central Bureau.

	£
(1) General Secretary	750
(2) Principal Assistant	500
(3) President, for incidental expenses other than travelling expenses	200
(4) Vice-President, for incidental expenses other than travelling expenses	100
(5) Office, laboratory, scientific and technical assistants, draughtsmen, clerks, servants, postage, telegrams and similar expenses	2250
(6) Travelling expenses ... . Note: Travelling expenses of commissioners attending meetings of the Council shall be borne by their respective Governments.	300
(7) Printing	500
(8) Incidental expenses	200
	£4800

D.—It is desirable that these investigations should begin May 1, 1901.

E.—The Conference declares that it is of the greatest importance, both for high sea fisheries and for the weather forecasts for long periods, that the Faröe Islands and Iceland should be included in the European telegraph system as soon as possible.

F.—The relation between the quantity of halogen contained in the water and the density of the water shall be carefully investigated by an experimental revision of the tables compiled by Knudsen (Ingolf Exp. ii. 37). The tables compiled by Makaroff, Krümmel and others for the relation of specific gravity to density and salinity are likewise in urgent need of experimental revision.

It is proposed to undertake these investigations in the technical institute at Copenhagen under the direction of a committee consisting of Sir John Murray, Messrs. Knudsen, Pettersson, Nansen, Krümmel, H. N. Dickson, and Makaroff. The means for carrying out these works are to be requested from such learned societies as have funds for such purposes.

G.—The Conference recommends that these resolutions be brought by the nations concerned to the knowledge of the Governments of France and Belgium.

H.—In case the resolutions of the Conference should be accepted by the States, it is anticipated that some length of time will elapse before the organisation of the central bureau is completed. In the meantime the Governments may wish to possess an organisation in connection with this Conference which may be useful in constituting the Council and the central bureau.

The members of the third committee—Åkerman, Drechsel, Von Grimm, Herwig, Hoek, J. Murray, Nansen, Pettersson—hereby offer their services for this purpose.

Appendix I. is on the quantitative estimation of pelagic fish-eggs and larvæ, by Prof. Hensen; Appendix II., on the Central Laboratory, by Prof. Nansen; Appendix III., on plankton investigations, by Profs. Cleve and Pettersson; and Appendix IV., on the marking of fishes in the waters of the region of the Baltic and the North Sea, by Dr. Trybom.

NOTES.

ONE of the most transcendent sights that it is given to man to witness is due next week. Those who saw the "falling stars" of 1866 readily acknowledge that there is no other phenomenon which is equal to it in majesty and enthralling beauty; and although comparisons are always odious, and generally misleading, some have held that the 1866 display was far more striking than a total eclipse of the sun. It is to be hoped, therefore, that the sky will be clear during the early mornings of next week. It appears from a communication of Messrs. Johnstone Stoney and Downing, which appears in another column, that it is not yet known whether the densest part of the meteors will be encountered on the morning of the 15th or during the next night. It is to be regretted that bright moonlight will certainly prevent the shower from being seen with the same effect as in 1866, if it should happen before the morning hours.

CERTAINLY not for many years has there been so much anxiety, either expressed or silently borne, as since some days ago, when the wire joining Ladysmith and civilisation was broken. Not only have the relatives of the 10,000 Britons beleaguered there been anxious, but all who take interest in the severe struggle which is now going on. It has been a matter of general surprise that in a campaign in which the cutting of telegraph wires was the first thing to be expected, and the investment of several isolated garrisons for a time was to be taken for granted, Marconi apparatus was not installed as a matter of course. We do not share this surprise; science, and especially the latest developments of science, are the last things to interest our Government and the Government Departments; they do not believe in science, they care to know very little about it, and the scientific spirit is absent from too many of their plans and doings. Hence we have now to be thankful that they have reached the level of the pigeon post, which has been the only official means, and that on the part of one or two birds, to keep us in touch with our beleaguered forces. It is stated that even the Commander in Chief, Lord Wolseley, has expressed some surprise that the so-called "Intelligence Department" of the Army allowed the Ladysmith force to go to the front with mountain guns against a Boer force which they should have known might be armed with Schneider-Canet cannons of large calibre; and it would seem that probably a terrible disaster has been prevented, not by our Intelligence Department, not by the outfit of our Army, but by the apparently accidental arrival of naval guns and *personnel* at the last moment. Why is there not a Scientific Committee to do what it can in advising the military authorities? If they could do nothing, nobody would be the worse, but they might be able to do much to the nation's advantage.

AT the anniversary meeting of the Royal Society on November 30, the following Fellows will be recommended by the President and Council of the Royal Society for election into the Council for the year 1900. The names of new members